

**IN THE SPECIFICATION:**

Please amend Paragraph [0036] to read as follows:

**[0036]** The two illustrations of Figure 1 will be described jointly below. An inventive constant velocity joint 11 comprises an outer joint part 12 with an aperture 25 with a closed base 13 and an integrally attached journal 14. Furthermore, the joint comprises an inner joint part 15, a ball cage 16 as well as torque transmitting balls 17. First outer ball tracks 18 and first inner ball tracks 19 accommodate balls  $17_1$  and form first pairs of tracks with one another. Second outer ball tracks 20 and second inner ball tracks 21 form second pairs of tracks which receive second balls  $17_2$ . The two types of pairs of tracks are alternately arranged around the circumference. Tangents at the balls in the points of contact with the first pairs of tracks which are shown in the drawing, together, form an opening angle  $\delta_1$  which opens in the direction towards the base 13. Tangents at the second balls  $17_2$  in the points of contact with the second pairs of tracks, together, form an opening angle  $\delta_2$  which opens towards the aperture ~~[[21]]~~ 25 of the outer joint part. When the joint is in the aligned condition and subjected to torque, said opening angles generate axial forces referred to as  $F_1$  and  $F_2$  and apply those to the balls and thus to the ball cage 16. A central joint plane E which receives the centers of the balls intersects the longitudinal axis of the joint in a joint center M, which longitudinal axis of the joint is defined by the longitudinal axis  $A_{12}$  of the outer joint part and by the longitudinal axis  $A_{22}$  of the inner joint part. With reference to the center lines  $L_{18}$  of the ball tracks 18 in the outer joint part 12, the tracks 18 in the central plane comprise a radius  $R_2$  whose center is offset by an axial offset  $O_2$  on the axis A relative to the joint center M, whereas the tracks 20 comprise an identically sized radius  $R_5$  whose center is offset by an offset  $O_5$  in the opposite direction relative to the joint center M.

Please amend Paragraph [0037] to read as follows:

**[0037]** In Figure 2, any details identical to those shown in Figure 1 have been given the same reference numbers. In Figure 2A, a shaft 22 is inserted into the inner joint part 15. In addition to the longitudinal axis  $A_{12}$  of the outer joint part, there is shown the longitudinal axis  $A_{22}$  of the inner joint part which, in the same way, corresponds to

the longitudinal axis of the inner joint part 15. With reference to the longitudinal axis  $A_{22}$ , service life angles  $[[2\beta]] \underline{2\beta_{SL}}$  are given on both sides; they indicate the maximum angle of articulation at which the joint can be operated without suffering any damage in the service life test. The service life test is meant to refer to a load spectrum which corresponds to the practical use of a joint in the course of the design service life. When the shaft 22 is articulated relative to the outer joint part 12 at the articulation angle  $[[2\beta]] \underline{2\beta_{SL}}$  on both sides each, the balls  $17_1$  in the inventive ball tracks 18, 19 carry out movements along the track center line, which movements are defined by the life angle  $[[\beta]] \underline{\beta_{SL}}$  on both sides each from the central joint plane E, wherein the legs of the angle  $\underline{\beta_{SL}}$  are formed  $[[by]]$  between the central joint plane E and by rays through the ball center and the joint center 11, when the shaft 22 is articulated relative to the outer joint part 12 at the service life angle  $2\beta_{SL}$ . Figure 2C shows the ball cage 16 in a developed view with three circumferentially distributed cage windows 23, 24. Balls  $17_1$  held in first pairs of tracks apply an axial force  $F_1$  to the ball cage and balls  $17_2$  held in second pairs of tracks apply an axial force  $F_2$  to the ball cage. Because of the alternating arrangement of first and second pairs of tracks, even when transmitting torque across via the joint, is axially balanced.

Please amend Paragraph [0038] to read as follows:

**[0038]** In Figure 3, the same features have been given the same reference numerals, and modified features have been indexed by 100. In Figure 3A, with reference to the longitudinal  $A_{22}$  of the shaft 22, there is shown on both sides each – in addition to the service life articulation angle  $[[2\beta]] \underline{2\beta_{SL}}$  – the maximum articulation angle  $2\beta_{max}$ . Accordingly, with reference to the position of the ball center relative to the outer joint part, there are again shown the service life angles  $[[\beta]] \underline{\beta_{SL}}$  as well the maximum articulation angles  $\beta_{max/2}$  on both sides, starting from the central plane E. The ball positions in the outer joint part at the maximum joint articulation angle  $2\beta_{max}$  are shown in dashed lines.

Please amend Paragraph [0039] to read as follows:

**[0039]** Figure 3B shows the maximum articulation angle at the joint 111 in a direction in which the balls 17<sub>1</sub> move in the inventive pairs of tracks 118, 119 towards the aperture [[21]] 25 of the outer joint part 112. Because of the S-shaped course followed by the inventive ball tracks 118, 119, the opening angle  $\delta_1$  between the tangents at the balls 17<sub>1</sub> in the first pairs of tracks has reversed its direction and also opens towards the aperture end of the outer joint part 112, whereas the second pairs of tracks with tracks 120, 121 of the Rzeppa joint type form an opening angle  $\delta_2$  whose size, admittedly, changes, but which, as in the aligned joint position according to Figure 2, continues to open towards the aperture end of the outer joint part 112. The directions of the forces  $F_1$ ,  $F_2$  acting on the balls in the sectional plane correspond to the opening angles  $\delta_1$ ,  $\delta_2$ . As can be seen in Figure 3C, all the ball forces, in respect of their effect, correspond to one another as regards their direction, even if not in respect of size, so that a counter force  $F_G$  for against the sum of the ball forces acting on the cage has to be applied by the outer joint part to the cage. In accordance with the invention, such a counter force  $F_G$  occurs only if the service life angle [[2 $\beta$ ]]  $2\beta_{SL}$  is exceeded, while inside the service life angle [[2 $\beta$ ]]  $2\beta_{SL}$  the cage remains axially balanced.

Please amend Paragraph [0040] to read as follows:

**[0040]** In Figure 4, similar features have been given the same reference numerals, and modified features have been further indexed by 100. Figure 4, in greater detail, shows a possible course which can be taken by the track center lines  $L_{18}$ ,  $L_{19}$  of the outer joint part 212 and of the inner joint part 215 for the inventive ball tracks 218, 219 according to a first embodiment. The inventive ball tracks whose course is represented by track center lines  $L_{18}$ ,  $L_{19}$  are S-shaped, and the figure also shows the position of the turning point  $T_{1-2}$  which, starting from a radius  $R_2$  (outer joint part) and, respectively,  $R_2'$  (inner joint part) is laid around an offset point  $O_2$  and  $O_2'$  respectively, is positioned at an angle  $\alpha$  relative to a radial plane, i.e. a plane extending parallel to the central joint plane E. Beyond the turning point  $T_{1-2}$ , the track center line continues in a radius  $R_1$  (outer joint part), and respectively,  $R_1'$  itself. In accordance with the invention, the turning point  $T_{1-2}$  as well as the turning point  $T_{1-2}'$  are positioned outside the angle

sector of the angle  $[[\beta]] \beta_{SL}$  as viewed on each side of the central joint plane E. As the reversal of the direction of the angle  $\delta_1$ , upon the turning point  $T_{1-2}$  being exceeded, takes place in the first pairs of tracks, the requirement as specified here ensures that, in the service life range (articulation of  $A_{22}$  relative to  $A_{12} < = [[2\beta]] 2\beta_{SL}$  on both sides each) no axial forces occur at the cage, but that the cage is kept free from axial forces in the outer joint part. The angle which is defined between the central joint plane E and the line through the joint center 11 and the turning point  $T_{1-2}$  is described as center angle  $\beta$ .

Please amend Paragraph [0041] to read as follows:

**[0041]** Whereas the service life angle  $[[\beta]] \beta_{SL}$  and the ~~is a~~ center angle with reference  $\beta$  are referred to the joint center M – i.e. it ~~starts~~ start from the longitudinal axis  $A_{12}$  and the central plane E respectively and, in this way, ~~describes~~ describe the position of a ball on the track center line  $L_{18}, L_{19}$  - the center of the angle  $\alpha$  at the tangent at the track center line in the turning point  $T_{1-2}$  features an offset  $O_2$  and  $O_2'$  respectively relative to the joint center M.

Please amend Paragraph [0042] to read as follows:

**[0042]** Figure 5 shows the relationship between the ~~service-life~~ center angle  $\beta$  with reference to the travel of the ball along the track center line  $L_{18}$  in the outer joint part 212 relative to the turning point angle  $\alpha$ , with the

$$\alpha \geq \beta + \arcsin \left[ \frac{O_2}{R_2} - \sin(\beta + 90^\circ) \right]$$

being applicable.

Please amend Paragraph [0044] to read as follows:

**[0044]** Figure 7 shows the relationship between the ~~service-life~~ center angle  $\beta$  with reference to the travel of the ball in the track and the turning point angle  $\alpha$  for a second possible embodiment of an inventive outer joint part 312. This figure shows the first outer ball track 318 and second outer ball track 320. In the region around the

central joint plane E, the center line L<sub>18</sub> of the ball track 318 comprises an arch having a smaller radius R<sub>2</sub> with a center M<sub>2</sub> which, relative to the joint center M, is offset by an axial offset O<sub>2</sub> and by a radial offset a. The tangent at the turning point T<sub>1-2</sub> is defined via said angle. From the turning point, the track center line continues with an arch having a radius R<sub>1</sub> around a center M<sub>1</sub> which is determined by the value of R<sub>1</sub> and by the value of the angle  $\alpha$ . Between the ~~service-life~~ center angle  $\beta$  centered around the joint center M and the turning point angle  $\alpha$ , there applies the equation:

$$\alpha \geq \beta + \arcsin \left[ \frac{O_2 + a \cdot \tan(\beta)}{R_2} - \sin(\beta + 90^\circ) \right]$$

Please amend Paragraph [0045] to read as follows:

**[0045]** Figure 8 shows the relationship between the ~~service-life~~ center angle  $\beta$  with reference to the travel of the ball in the track and the turning point angle  $\alpha$  for a ~~second~~ another possible embodiment of an inventive outer joint part 412. This figure shows the first outer ball track 418 and second outer ball track 420. In the region around the central joint plane E, the center line L<sub>18</sub> of the ball track 418 comprises an arch having a smaller radius R<sub>2</sub> with a center M<sub>2</sub> which, relative to the joint center M, is offset by an axial offset O<sub>2</sub> and by a radial offset b. The tangent at the turning point T<sub>1-2</sub> is defined via said angle. From the turning point, the track center line continues with an arch having a radius R<sub>1</sub> around a center M<sub>1</sub> which is determined by the value of R<sub>1</sub> and by the value of the angle  $\alpha$ . Between the ~~service-life~~ center angle  $\beta$  entered around the joint center M and the turning point angle  $\alpha$ , there applies the equation:

$$\alpha \geq \beta + \arcsin \left[ \frac{O_2 - b \cdot \tan(\beta)}{R_2} - \sin(\beta + 90^\circ) \right]$$